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ABSTRACT

Many examples of cooperative projects between English for Specific Purposes (ESP) units and university subject departments have been reported in the literature. Most are case studies of specific ESP programs, and explanations of methodologies have not been prominent. This paper reviews the different ways in which cooperative methods have been used in ESP programs, beginning with the history of cooperative teaching methods in engineering more than 100 years ago. Cooperative methods are categorized into four types according to the level of involvement of the subject specialist in the ESP program. Advantages and disadvantages of the methods are discussed and it is concluded that the advantages considerably outweigh the disadvantages. It is suggested that the purposes of the methods are to achieve cultural syntonicity (i.e., coherence) with the content subjects, since academic development and language development proceed concurrently. The paper concludes by suggesting that ESP professionals can learn from the experience of engineering in exploiting the advantages it gained from cooperative teaching methods to improve its status. Contains 56 references. (LB)

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Cultural Syntonicity: Co-operative Relationships Between The ESP Unit And Other Departments[1]

Colin Barron

Many examples of co-operative projects between ESP units and subject departments have been reported in the ESP literature since Selinker's seminal paper appeared in 1979. Most are case studies of specific ESP programmes. Explanations of the methodologies have not been prominent. This paper is an overview of the different ways in which co-operative methods have been used in ESP programmes. It begins with the history of co-operative teaching methods which indicates that the methods were first used over 100 years ago in engineering. Co-operative methods are categorised into four types according to the level of involvement of the subject specialist in the ESP programme. The advantages and disadvantages of the methods are discussed, concluding that the advantages considerably outweigh the disadvantages. It is suggested that the purposes of the methods are to achieve cultural syntonicity (i.e. coherence) with the content subjects, since academic development and language development go hand in hand. Finally, the paper concludes by suggesting that ESP can learn from the experience of engineering in exploiting the advantages it gained from co-operative teaching methods to improve its status.

Introduction

"How can we teach the NNS [non-native speaker] to read this stuff when we don't even know what we don't even know!" (Selinker 1979, p.201).

This plaintive cry by one of Selinker's co-researchers is an acknowledgement that ESP teachers need help in understanding the rhetorical, organisational and processual conventions of the subjects they service. This kind of information can be obtained from subject specialists by using ethnographic tools available to us, such as structured interviews, observation and analysis. A more integrative approach is to engage the subject specialist in co-operative teaching methods, such as collaborative teaching and team teaching. All these methods - subject-specialist informants, collaborative teaching and team teaching - are the subject of this paper.

Co-operative teaching methods, including team teaching, appear not to have been major methodological movements in EFL/ESL before the advent of ESP, although they were used in teaching English to native speakers in British and American schools (Adams 1970; Grannis 1964). I can find no mention of them, for example, in Howatt's history of English language teaching (1984). Since Selinker's pioneering study in 1979, various co-operative projects in ESP have been reported in different parts of the world. These are summarised in figure 1 below.

Most of the reported examples of co-operation between the ESP unit and other departments are case studies of ESP programmes. Detailed explications of the methodology are not common, and as far as I know there is no overview of the field in ESP. Doubts have been raised as to the relative efficiency of using subject specialists (e.g. Swales 1990, p.129). I wish to share my extensive experience of using co-operative methods at the PNG University of Technology which illustrate some of the considerable advantages that can be gained as a result of the interdisciplinary relationships that are created by these methods.

Colin Barron arrived at the University of Hong Kong in December 1991 after spending eight years at the PNG University of Technology in Lae where he developed collaborative teaching projects in all of the courses that he taught. His interest in cross-cultural studies started when he was a student of Arabic and Persian at Edinburgh University and has continued and been enhanced by living and working in Iran, Jordan and Nepal, as well as PNG.

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

In this paper I first discuss how co-operative teaching methods have an established educational pedigree, stretching back more than 100 years in other subjects. Then I describe the different ways that co-operation can take place between the ESP unit and other departments, discuss the purposes of each one, and their advantages and disadvantages, and introduce the notion of cultural syntonicity (i.e. the aims and activities of the ESP programme are coherent with the students' subjects of study (Papert 1980, p.68) as the main purpose of these methods. Finally, conclusions are drawn on how ESP can exploit co-operative methods to improve its status.

History of Co-operative Teaching Methods

The earliest instance of co-operative teaching I can find dates back to 1888 when a professor of civil engineering at Ohio State University sought help from his surveying colleagues to teach surveying skills to his engineering students (Sherman & Schlafly 1920). Initial experiments in co-operative teaching thereafter appear to have taken place in universities (Stevenson 1921, p.158-168), specifically involving engineering departments and other departments, for example mathematics (Root 1916) and surveying (Sherman & Schlafly 1920).

The most intense form of co-operative teaching, team teaching, has been recognised as a useful method for about 30 years in schools on both sides of the Atlantic, since 1954 in American schools (Shaplin 1964a, p.1), and since the 1960s in British schools (Adams 1970; Freeman 1969; Warwick 1971).

In ESP, the parameters were defined early on in its history (paralleling engineering's experience at a similar stage in its development) by Selinker (1979). He posited several key research questions and suggested a methodology, using as an example a subject-specialist informant (SSI) in genetics. The model was further refined in a later paper (Bley-Vroman & Selinker 1984). Selinker's notion of subject-specialist informant (SSI) has since been extended to include subject specialists working with ESP teachers at more integrative levels than he initially described, including close co-operation at all stages of the ESP programme, i.e. collaborative teaching and team teaching.

Co-operative Methods

I agree with Stephenson when she says, "By its nature every instance of ESP must be unique" (nd: p.1). But this statement refers to course design and materials. It does not necessarily apply to methodologies. The history of co-operative methodologies shows that they are not unique to ESP. We can learn from others' experiences with co-operative teaching methods to enhance student learning by creating cultural syntonicity (Papert 1980, p.68), to forge interdisciplinary relationships, and to bring benefits which raise the profile of the ESP unit vis-a-vis the departments it services.

Four methods of working with colleagues in other departments are outlined in this section. Each successive method subsumes the modus operandi inherent in the previous ones, but each can be used separately. Individual teachers can decide which method best suits them and their situation.

The subject-specialist informant (SSI)

Subject-specialist informants provide the naive ESP teacher with insights on the content and organisation of texts and on the processes of their subject. Selinker (1979) was the first to describe this method in an article which showed how structured questioning can elicit the rhetorical functions of a text from the informant, in this case a research article in genetics.

The method has since been used at all stages in ESP. It has been used to determine the use of specific language points in one genre of a particular subject, e.g the use of the passive in astrophysics research articles (Tarone, Dwyer, Gillette & Icke 1982), or alternants in surgical reports (Pettinari 1983). It has been used to determine the schema of chapters in introductory textbooks in geology (Love 1991), and in analysing examinations; "what the subject-teacher intends by the questions he sets; what sort of

structuring is expected in the answers; and what sort of performance is accepted as adequate" (Johns & Dudley-Evans 1980, p.9). It has also been used to specify needs prior to course design (Ramani, Chacko, Singh & Glendinning 1988). In an interesting variation, Zumrawi (1984) used the method with a non-native speaker of English to determine his teaching methodology, hypothesising that:

> The SEI [specialised educational informant] at the Polytechnic makes significant amendments in his teaching content and methodology so that students can cope with their learning load. (Zumrawi 1984, p.9)

A specialised educational informant (SEI) was consulted to find out what actually happened in the classroom rather than what the syllabus laid down because

> It was felt that such information could be of significant use in helping us to narrow the gap between what we provide in terms of syllabuses and materials and the students' *real* needs. (Zumrawi 1984, p.8; emphasis in original).

A process-oriented approach was considered to be more useful than a target-oriented approach because the primary purpose of ESP courses is to produce students who are good students of engineering through the medium of English, rather than merely good at English. "The students arrive with some knowledge of grammatical rules but little communicative competence, and few are actually capable of following their studies without help" (Zumrawi 1984, p.11).

In general, co-operative methods involving the processes of the content subject are rare. Two examples, using students as informants, are Jacobson (1986) and Schmidt (1981). Both investigated how students go about acquiring the knowledge of their subject, in the physics laboratory and in the lecture room respectively, as part of their needs analyses.

The SSI method involves making use of ethnographic tools to gather the data. These are typically structured and unstructured interviews, observation, field notes, and recordings.

The purpose of this method is to enable naive ESP teachers to become informed about unfamiliar artefacts, such as technical texts, and processes in a subject that is completely alien to them. As noted above, the majority of research has concentrated on products, but processes can be investigated as well. The data elicited can be used in the classroom to teach the students how and why information is structured in their subject of study.

The Consultative Method

The consultative method involves bringing in the subject specialist as a consultant at specific stages in a course or project to provide his/her expertise on specific content. The consultant may be brought in at any stage. At the design stage he/she may suggest topics for projects. During the course he/she may give tutorials (Gee et al. 1984, p.121) or lectures (Barron 1992, forthcoming), hold discussions (Adams-Smith 1980), provide assistance in writing (Johns & Dudley-Evans 1980, p.8-9), or help to assess the students' performance on a project. At the Papua New Guinea (PNG) University of Technology we used consultants to advise students on how to work through the calculations for a project, mark them, assist at the testing stage of a project so that the students were aware of the scientific concepts underlying what they are doing, judge models (Barron 1991, 1992), and mark the product (assignments, reports). In all of these examples, the consultant visited the students. The students can also visit the consultant (Adams-Smith 1980).

The purpose of this method is to provide specialist input at key stages in the course so that the English course maintains content correctness, because, unlike the collaborative method which follows, in ESP programmes that use the consultative method the content is often determined by the ESP course designers. The ESP teacher can concentrate on how the students communicate rather than what they communicate. It is often used in situations in which the English course is supplementary to the students' subjects of study, e.g. in situations where English is compulsory. One of the aims of the ESP programme

may be to convince the students that the English they are studying is complementary to their subject of study.

Collaborative Teaching

Collaborative teaching has been generally taken as a form of team-teaching (e.g. Nolasco 1981), but I prefer to regard it as a distinct category because it occurs at a less integrative point on the continuum (see fig. 2). Often the reasons for choosing to be collaborative rather than interventionist (i.e. team teaching) are pragmatic, e.g. timetabling constraints or economic constraints, but there may be other reasons, for example sharp differences in the pedagogic methods of the teachers.

The collaborative method is the one in which the ESP teacher and the subject specialist collaborate on all aspects of the course - needs analysis, design, teaching and assessment - but do not actually share the classroom. A key feature of collaborative programmes is that the content is determined by the subject department, not the ESP unit. The ESP teacher teaches the language and communication skills, and the subject teacher teaches the concepts and other skills needed. An example is the project with economics students at the Universidad del Valle in Colombia (an EFL situation), where, because "for administrative reasons, timetables could not be arranged to make it possible for us to attend each other's classes" (de Escorcia 1984, p.136), the ESP course was taught in parallel to the economics course, using the same texts. Another example was the "phased" approach at the University of Birmingham (Henderson & Skehan 1980):

> joint planning of the work both at the macro level - overall definition of aims, agreement on syllabus, specification of teaching methods and relationship between English and Economics inputs etc - as well as the micro level shared materials, (informal) knowledge about exactly what students were doing, what points they had reached, feedback about students' problems etc. (1980, p.44).

I used this method at the PNG University of Technology with first-year architecture students because timetable constraints did not allow the architecture lecturer and myself to be in the classroom together. The students had a studio class for seven hours a week in which the architecture teacher taught drawing and other architectural skills. I taught language and communication skills in my classes, and the two sets of skills were combined in a series of joint projects, the most enjoyable of which was an annual week-long fieldtrip to study the traditional architecture and social life of two remote villages in PNG. The resulting assignments were joint marked by the architecture lecturer and myself.

The aim of the collaborative method is the integration of content and language skills, providing constant monitoring of the situation at all stages by both the language specialist and the subject specialist. It is often used in situations in which the students have a specific task, e.g. writing a research dissertation, or preparing to enter an English-medium university (Johns & Dudley-Evans 1980). In these situations the language needs are very apparent to the students and the English course is complementary to the students' subject. However, it can also be used in situations where English is supplementary, as in our use of it with first-year architecture students in PNG.

Team teaching

True team teaching (intervention) is where the ESP teacher and the subject teacher co-operate fully throughout the course, including sharing the classroom. The whole course is fully worked out by both - design, materials, methodology, assessment - and the two teachers are present in the classroom at all, or most, times. It has been defined as:

> a type of instructional organization, involving teaching personnel and the students assigned to them, in which two or more teachers are given responsibility, working together, for all or a significant part of the instruction of the same group of students. (Shaplin 1964a, p.15)

An early ESP case study of team teaching at the University of Birmingham is given in Johns & Dudley-Evans (1980). I have used this method to teach final-year communication engineering students and chemical technology students in PNG. All these examples took place inside a traditional classroom. Team teaching can take place outside the traditional classroom, for example on an architecture fieldtrip (Barron 1986). The connection between English and architecture became very apparent to the students in this situation because they needed to interview people to obtain their data and they needed to record them accurately.

Successful team teaching requires considerable organisational and management skills. Detailed planning is required at all stages, regular meetings have to be arranged, and potential clashes, such as those which arise as a result of differences in status, temperament or pedagogical methods, have to be kept to a minimum. Team teaching probably works best with two teachers, as most of the reported experiments in ESP involve two teachers, but it can involve more. In American schools, teams of three to six teachers have been used (Anderson 1964, p.192-194).

The purpose of team teaching is to achieve educational efficiency by exploiting the fact that cognitive development and language development proceed together. The mixture of skills and content inherent in ESP is too complex and specialised for one person alone. Splitting the work horizontally according to specialisms (Shaplin 1964b, p.81-87) with both teachers in the classroom together is an efficient way of teaching and more than justifies the cost because the whole is "much more than the sum of its parts" (Jackson & Price 1981, p.38) and a level of informality develops "leading to a level of interaction much higher than would normally be the case" (Jackson & Price 1981, p.40). This is an observation I have noticed in my own experiences team teaching the final year communications engineering students at the PNG University of Technology. The level of motivation, aided by the fact that the students had just returned from six months' industrial training where they learnt the importance of good communication skills, the number of jokes, and the quality of the work were all greater than in other classes.

Team teaching thus has a hidden agenda, to develop the classroom as a social system (Shaplin 1964b, p.66).

> The individual identifies with the role, with the group, and with the goals of the organization in terms of his need dispositions, his personal aspirations and expectations, his needs to express himself, and his peculiar demands for rewards and satisfactions. (Shaplin 1964b, p.68)

The result is perhaps the creation of a group culture (Shaplin 1964b, p.69) in which "the group establishes its own climate or culture in adjustment to the demands of the formal organization and of the individuals which make up the group" (Shaplin 1964b, p.69). In the most successful situations, all the members of the group are in harmony with one another, resulting in an ideal environment for syntonic learning (Papert 1980, p.63) to take place because each student is able to relate to both the subject and the other members of the group.

Figure 1: Overview of co-operative projects in ESP

Reference	Country	Level	Subject	Stage/Input
Informant				
Huckin & Olsen 1984	USA	EFL	genetics	rhetorical features
Jacobson 1986	USA	EFL	physics	needs analysis
Love 1991	Zimbabwe	ESL	geology	needs analysis, materials
Morray 1980	Algeria	EFL	electrical engineering	need analysis, materials
Pettinari 1983	USA	ESL	medicine	rhetorical features
Ramani et al. 1988	India	ESL	management, electronics	needs analysis
Schmidt 1981	USA	EFL	business administration	needs analysis
Selinker 1979	USA	EFL	genetics	rhetorical features
Tarone et al. 1982	USA	EFL	astrophysics	grammatical features
Zumrawi 1984	Sudan	EFL	electrical engineering	course design
Consultant				
Adams-Smith 1980	Kuwait	EFL	medicine	materials, content, panel member
Barron 1991, 1992, forthcoming	PNG	ESL	engineering	teaching, marking assessment
Gee et al. 1984	UK	EFL	civil engineering	needs analysis, materials, tutorials assessment
Hansen & Van Hammen 1980	Algeria	EFL	electrical engineering	teaching
Koh & Cheung 1985	Singapore	ESL	engineering	content, marking
van Naerssen & Brennan 1992	USA	ESL	sociology	
Smyth et al. 1980 1980	UK		technology, life sciences, physical sciences, sociology	testing

Collaborator

Barron 1986	PNG	ESL	architecture	needs analysis, course design, materials
de Escorcia 1984	Colombia	EFL	economics	needs analysis, materials, course design
Henderson & Skehan 1980	UK	EFL	economics	all
Houghton 1980	UK	EFL	accounting	materials
King nd	Colombia	EFL	several (not stated)	needs analysis, materials, course design
Siegel & Dube 1982	PANG	ESL		
Skehan 1980	UK	EFL	economics	all
Snow et al. 1989	USA	NS/ESL	not stated	course design, materials

Colleague

Chamberlain 1980	Zambia (Namibian refugees)	ESL	mathematics	all
Dudley-Evans 1984	Singapore	ESL	building	all
Ivanic et al. 1980	UK	NS	sociology, history, home economics	all
Jackson & Price 1981	UK	NS/EFL	civil engineering	all
Johns & Dudley-Evans 1980	UK	EFL	transportation, biology	all
Moorhouse 1980	UK	NS	literacy	all
Tshuma & Morrison 1992	Zimbabwe	ESL	law	all

A Continuum

I have described the four methods separately, but I do not wish to give the impression that they are discrete. The boundaries between them are not distinct, but overlap quite considerably. The differences lie in the degree of co-operation that takes place between the ESP unit and other departments. Subject specialists can thus be placed on a continuum that reflects their level of involvement in the ESP programme. This is shown in figure 2.

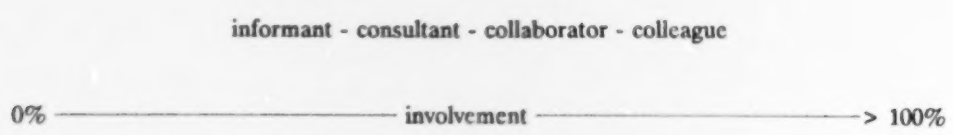

Figure 2: The co-operative continuum

Discussion: the advantages and disadvantages

The advantages of the various co-operative teaching methods can be divided into two: overt and covert. The overt advantages are that ESP teachers can find out what they do not know from the experts. There is the possibility, of course, that the ESP teachers may be in danger of "believing all that they hear" (Swales 1990, p.129). This is a real danger that should be guarded against. Other advantages are advantageous to the promotion of interdisciplinary relations between departments that might not otherwise exist. Tangible results are joint articles (e.g. Tshuma & Morrison 1992), modification of the subject teacher's language to make it understandable to students in lectures (Morray 1980, p.88), and even changes in the content subject as a result of the insights provided by applied linguistics (Stephenson nd: p.8).

Co-operative methods have very tangible results for the students. One of these is that they should become aware of the direct relationship that English has for their subjects of study, particularly if the complementary aspect is made explicit to them. Snow, Met & Genessee (1989, p.215) report that these methods promote higher order skills than those in traditional learning methods. This in turn promotes advanced levels of proficiency in language, leading to more elaborate language skills and more cognitively demanding tasks. This can lead to modification of the expectations that subject teachers have regarding the communicative and academic capabilities of the students.

There is some evidence for this claim. Van Naerssen and Brennan report that L2 students of sociology at the University of Pennsylvania "surprised their sociology professors by producing better data and reports than many of their L1 classmates" (1992) after they had been prepared by the ESP unit for their task of eliciting attitudes to religion in inner-city homes. At the PNG University of Technology, two effects of the close collaboration between subject lecturers and ESP teachers were noticed. Firstly, the high quality of the technical paper written by students for a project that combined their background knowledge of traditional technology with the consultative method (Barron 1991) encouraged engineering lecturers to increase the written requirements of some of their courses in the first and second years. Secondly, the engineering departments introduced project work into the foundation year course because of its role in teaching key engineering concepts, in encouraging an advanced level of communication, and in generating a high level of motivation.

The covert advantages are often of considerable benefit to the ESP unit and in the long run to the students. Swales (1990, p.129) raises the objection that these methods are very time consuming. This is true, but the investment in time can pay big dividends which more than compensate for the amount of time invested. From my own and my colleagues' experience at the PNG University of Technology, co-operating with other departments resulted in two important benefits for the Language and Communication Studies (LCS) Department. Firstly, it led to increased hours for English courses. We were also asked to provide new courses, particularly for final-year students. This enabled us to increase staff numbers and train more Papua New Guineans to take over when the expatriates left. It also enabled us to provide a more valid course for first-year students knowing that skills needed later could be dealt with in the final year after they had undergone a period of industrial training when they learnt the value of good communication skills. Motivation on these final-year courses was generally high because of this.

The second unforeseen benefit was in the political arena. Partly as a result of the very good relationships established with lecturers in other departments through various co-operative teaching projects, the LCS Department found that it had important allies on key committees and support for important decisions affecting it. One of these was a decision by the university to maintain the status of the department vis-a-vis the other departments. The co-operative teaching experiments were a major factor in creating a positive image of the department and in considerably raising its profile. This same positive effect was also found by Ramani and her colleagues in India as a result of their co-operation with colleagues in technical departments (Ramani et al. 1988, p.87).

Swales states, "We might conclude, then, that the role of the subject specialist informant ... remains somewhat controversial" (1990, p.129). Given the very positive benefits that can accrue to the ESP unit as a result of the good relationships established with informants, their role is a vital element in the raising of the profile of ESP units worldwide. The use of co-operative methods is the first step in establishing parity with other disciplines.

The advantages should not obscure some of the problems associated with co-operative teaching methods. These include timetabling problems when two or more staff members need to be in the same classroom, the clashes that may occur when two very different pedagogic methods meet in the classroom, and a rapid turnover of staff necessitating the establishment of new relationships at regular intervals. For example, I worked with six different studio masters of five nationalities in eight years of collaborative teaching of the first-year architecture students at the PNG University of Technology. A similar problem in Colombia was the relocation of staff within a department away from responsibility for liaising with the English department (King nd: p.36). Another problem is persuading the financial controllers that team teaching is economic.

Team teaching is very time consuming and very demanding on organisational and management skills. Clear goals have to be determined, otherwise conflicts will arise. Major differences in personality have to be kept in check, and major problems can occur if the group takes on goals and intentions that are at variance with the original objectives of the team. The aims, objectives and teaching methods have to take account of the strengths and particularly the weaknesses of all members of the team. It can be particularly disastrous if one member of the team has an agenda that differs from the goals that the team has determined.

Cultural Syntonicity

All the methods described above have a single purpose: to enable ESP teachers to ensure that the language competence of the learners develops with their academic competence. Cognitive competence and communicative competence cannot be separated. Studies on young children show that language learning and cognitive development proceed together:

> In making sense out of what people are saying and in speaking in a sensible fashion themselves, children relate linguistic forms to social situations. Part of their acquired knowledge of a linguistic form is the set of relations that obtain between that form and social situations, just as part of their acquired knowledge of a social situation includes the linguistic forms that define or characterize it. (Ochs 1988, p.2)

Ochs goes on to state that the result of this "is that children are acquiring linguistic and sociocultural knowledge hand-in-hand as they assume various communicative and social roles in language activities" (1988, p.17). In other words, "language is not acquired without culture" (Ochs 1988, p.38). EFL/ESL students entering university are in a similar position:

> For the student new to a discipline, the task of learning the distinctive mode of analysis ... is indivisible from the task of learning the language of the discipline... One area of development cannot proceed without the other. (Ballard & Clanchy 1988, p.17)

Teaching the students involves initiating them into the discipline, or culture, since "the process of acquiring language is embedded in the process of socialization of knowledge" (Ochs 1988, p.3):

> Instruction in any discipline is acculturation, or the bringing of the student into the "interpretative community" of the discipline. And there is evidence that each discipline is also a "rhetorical community," which is to say a field with certain norms, expectations, and conventions with respect to writing. (Purves 1986, p.39)

In ESP, the notion of distinct "discourse communities" (Swales 1990, p.24-27) is now a reality, each with one or more genres. Love (1991), for example, suggests that an introductory textbook of geology has the purpose of initiating the newcomer into the cognitive model of geology, and that this is realised by the structure of chapters and in discourse cycles within chapters.

The direct association of culture and language, with each subject as a separate culture with its own genres, is not how language learning in the EFL or ESL situation has traditionally proceeded:

> For children who are L2 learners ... traditional methods for teaching second/foreign languages often dissociate language learning from cognitive or academic development. In contrast, an integrated approach brings these domains together in instruction. (Snow et al. 1989, p.201-202)

What ESP aims to do is to associate language learning with academic development so that the students become competent members of their subject. It does so by identifying key activities (genres) specific to a particular subject, drawing on topics in the subject (or culture), and teaching how and why the genres are used. Co-operative teaching methods are an efficient means of combining the language and cultural expertise so that academic development and language development can proceed hand in hand.

The assumption here is that each subject is a separate culture, identified as such by differences in methodology, artefacts, discourse features, and even dress. The definition of culture underlying this is the one proposed by Goodenough:

> Culture consists of whatever it is one has to know or believe in order to operate in a manner acceptable to its members, and to do so in any role they accept for any one of themselves. (Goodenough 1957, p.167)

Culture by this definition is a semiotic system (Geertz 1973, p.5) whose purpose is to search for meaning. It is "the end product of learning" (Goodenough 1957, p.167). ESP aims to provide the students with the means to search for meaning in the subjects (or cultures) they are entering, the successful end product of which is acceptance as a member of the subject (or culture). Co-operative teaching methods are a positive means of ensuring that the content subject and ESP are firmly connected so that this end is achieved. The co-operation results in cultural syntonicity (Papert 1980, p.68), i.e. coherence between the subject (culture) and ESP.

Most ESP teachers have not been initiated into these cultures, which is why they need help, and the cry for help at the beginning of this article is a clear signal of that need. Acknowledgement that help is needed is made explicit by the use of co-operative methods such as those outlined here. The result is a professional approach which is acknowledged by colleagues in other departments, a necessary pre-requisite to becoming accepted as fit members of the academic culture. Anthropology (Bernard 1988), the ethnography of communication (Saville-Troike 1982) and genre analysis (Swales 1990) all provide ESP teachers with the tools to use with the methods to ensure a professional approach. There is no longer any excuse for ESP teachers to blunder around in ignorance and incur the disrespect of subject specialists, as Henderson and Skehan describe:

> Most language teachers designing ESP courses have met the subject specialist who conveys his unspoken or overt feelings that language teachers manage to miss the point, concentrate on the inessential, or generally blunder around in areas where they are not competent. (1980, p.41)

Conclusion

Co-operative teaching methods are flexible because they can be used with students of different levels and in different countries. They are perhaps most effective when the English course or component is complementary to the content subject, rather than supplementary. The level of involvement of the subject specialist can be specified, depending on the circumstances. Thus the subject specialist can be informant, consultant, collaborator or colleague. The methods have proven to be robust, with an unbroken use of more than a hundred years in engineering. It is perhaps fitting that ESP, so involved as it is with engineering, should follow in such an honourable engineering tradition.

Lessons can be learnt from engineering's experience of co-operating with other subjects. Engineering has had to fight hard to establish its status in universities, particularly in the UK. An important part of winning this battle has been the forging of allies in well established subjects such as mathematics. One of the strategies engineering has used in this battle has been the development of close interdisciplinary ties by means of co-operative teaching methods undertaken with departments such as mathematics and physics, and they have probably been an important factor in the battle to achieve its current status. ESP should emulate what engineering has done for more than 100 years and exploit co-operative teaching relationships with other departments. To do so would be the first step in enhancing its status, as well as providing ESP teachers with the means of finding out what they do not know.

Note

[1] I have used the phrase "ESP unit" as a superordinate to refer to departments in which ESP teaching takes place. These include Language Centre, English Centre, Language & Communication Studies Department, Communication Skills Centre, etc. When referring to specific departments I have used the actual name of the department, e.g. the Department of Language and Communication Studies at the PNG University of Technology.

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